

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-11 (Canceled).

Claim 12 (Previously presented): A process for the valorisation of metal values in a Zn-, Fe- and Pb-bearing residue, comprising the steps of:

subjecting the residue to a flash or agitated bath fuming step, thereby producing an Fe-bearing slag and Zn- and Pb-bearing fumes; and

extracting the Zn- and Pb-bearing fumes and valorising Zn and Pb; wherein either one or more of CaCO₃, SiO₂ and MgCO₃ are added as a flux before or during the fuming step so as to obtain a final slag composition with:

$$\frac{[Fe]}{[SiO_2]} + \frac{[CaO]}{[SiO_2]} + \frac{[MgO]}{3} > 3.5;$$

$$0.1 < \frac{[CaO]}{[SiO_2]} < 1.3; \text{ and}$$

$$6 < [SiO_2] < 22,$$

all concentrations being expressed in wt%.

Claim 13 (Previously presented): A process according to claim 12, wherein the Zn-, Fe- and Pb-bearing residue is a neutral leach residue or a weak acid leach residue.

Claim 14 (Previously presented): A process according to claim 13, wherein only one or both of dolomite and limestone are added as a flux.

Claim 15 (Previously presented): A process according to claim 12, wherein the concentration of MgO in the final slag is less than 5 wt%.

Claim 16 (Previously presented): A process according to claim 12, wherein the Zn-, Fe- and Pb-bearing residue contains Cu and precious metals, and, during the fuming step, a

matte or alloy is produced containing a significant part of the Cu and a significant part of the precious metals.

Claim 17 (Previously presented): A process according to claim 12, wherein the Zn-, Fe- and Pb-bearing residue contains Ge, a major part of the Ge is fumed together with Zn and Pb, and the residue is subsequently separated.

Claim 18 (Previously presented): A process according to claim 17, whereby the separation of Ge is performed by co-precipitation with Fe hydroxide or by addition of tannic acid.

Claim 19 (Previously presented): A process according to claim 12, whereby the process is performed in a reactor selected from the list consisting of a plasma flash furnace and a submerged lance furnace.

Claim 20 (Previously presented): A process according to claim 12, whereby the fuming step is performed in a reactor containing a molten phase, and comprising one or more plasma tuyeres as heat and gas sources, said tuyeres being arranged such that the plasma is generated under the surface of said molten phase.

Claim 21 (Withdrawn): A single-chamber smelting and fuming reactor for treating Zn-bearing residues, said reactor being designed to contain a molten slag phase up to a determined level, said reactor comprising a plasma fired tuyere attached to a plasma torch as heat and gas source, said tuyere being arranged such that the plasma is generated under said level.

Claim 22 (Withdrawn): A single-chamber smelting reactor according to claim 21, wherein the peripheral walls of the reactor are water-cooled.

Claim 23 (New): A process for the valorisation of metal values in a Zn-, Fe- and Pb-bearing residue, comprising the steps of:

subjecting the residue to a flash or agitated bath fuming step, thereby producing an Fe-bearing slag and Zn- and Pb-bearing fumes; and

extracting the Zn- and Pb-bearing fumes and recovering Zn and Pb; wherein either one or more of CaCO₃, SiO₂ and MgCO₃ are added as a flux before or during the fuming step so as to obtain a final slag composition with:

$$\frac{[Fe]}{[SiO_2]} + \frac{[CaO]}{[SiO_2]} + \frac{[MgO]}{3} > 3.5;$$

$$0.1 < \frac{[CaO]}{[SiO_2]} < 1.3; \text{ and}$$

$$6 < [SiO_2] < 22,$$

all concentrations being expressed in wt%.